AMSAT News Service Weekly Bulletins
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SB ALL @ AMSAT $ANS-090.01
RUDAK-2 MULTI MODE TRANSPONDERS

HR AMSAT NEWS SERVICE BULLETIN 090.01 FROM AMSAT HQ
SILVER SPRING, MD MARCH 31, 1990
TO ALL RADIO AMATEURS BT

RUDAK-2 To Carry Mode B Linear Transponder & Packet Radio

RUDAK-2, the second generation packet radio experiment to RUDAK which was flown on AO-13, has now been completed, tested, and fully integrated into a Soviet geological research satellite, known as GEOS, and is scheduled to fly in July. RUDAK-2 will not only carry a Mode B linear transponder for SSB and CW contacts but will also carry a variety of packet radio experiments. The digital communication capability of RUDAK-2 is astounding: five different data rates from 400 bps to 9600 bps using various modulation schemes. Radio amateurs will have the choice of using four different uplink frequencies for the various data rates. There is also a provision for digital signal processing (DSP) experimentation. Powering this "super-TNC" will be two on-board computers, providing processing at 15 Million Instructions Per Second (MIPS). RUDAK-2 will be compatible with AX.25 protocol and those amateurs who are equipped for FO-20, PACSAT, LUSAT, AO-13 PSK telemetry, and UO-14 will be ready to use RUDAK-2. The following are the transponder specifications provided by AMSAT-DL:

Amateur Radio Payload: Linear and Regenerative Transponders

Linear Transponder Uplink: 435.030 - 435.120 MHz (90 KHz)
Linear Transponder Downlink: 145.880 - 145.970 MHz (inverted)
Output Power: 12 watts HF maximum.
Beacon : 145.880 MHz, CW telemetry.

RUDAK-II: Two onboard computers with IPS operating systems for packet radio (AX.25) (Mailbox, telecommunications experiment with Digital Signal Processing up to nearly 20 KHz, etc.) 1 MByte RAM disk. Four separate uplink channels.

Gain of satellite RX and TX antennas: 2.3 dBi each (dipoles)

Input sensitivity: < -125 dBm (435 MHz) for a C/No of 45 dBHz

SAT-RX-1: 435.016 MHz +-10 KHz 1200 bps, FSK, NRZIC/Biphase-M (JAS, PACSAT)
SAT-RX-2: 435.155 MHz +-10 KHz (AFC) 2400 bps, BPSK, Biphase-S
SAT-RX-3a: 435.193 MHz +-10 KHz (AFC) 4800 bps, RSM, NRZIC/Biphase-M
SAT-RX-3b: 435.193 MHz +-10 KHz (AFC) 9600 bps, RSM, NRZI (NRZ-S) + Scrambler
SAT-RX-4: 435.041 MHz +-10 KHz (digital AFC) RX for RTX-DSP experiments

The downlink can be switched to the following operating modes:
Transmit frequency: 145.983 MHz

Mode 1: 1200 bps, BPSK, NRZI (NRZ-S) (like FO-20)
Mode 2: 400 bps, BPSK, Biphase-S (AMSAT mode for OSCAR-13 beacon)
Mode 3: 2400 bps, BPSK, Biphase-S (planned for OSCAR-13)
Mode 4: 4800 bps, RSM, NRZIC (Biphase-M) (like 4800 bps uplink)
Mode 5: 9600 bps, RSM, NRZI (NRZ-S) + Scrambler (like 9600 bps uplink)
Mode 6: CW keying (only for special events)
Mode 7: FSK (F1 or F2B), e.g. RTTY, SSTV, FAX, etc (only for special events)

Mode 8: FM modulated by D/A signals from DSP-RISC processor (e.g. speech)

Power consumption: 14V @ 350 mA (max) = 4.9 W;
                    Standby: 80 mA (RUDAK without power amplifier)

RUDAK-2 is a joint project of AMSAT-U-ORBITA, the Adventure Clubs in Moscow
and the AMSAT-DL/RUDAK Group in Marburg, Munich and Hannover.

[ANS would like to thank DB2OS and DJ0HC/KE6MN for providing this
 information about RUDAK-2]

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SB ALL @ AMSAT $ANS-090.02
DO-17 RECOVERY EFFORTS CONTINUE

HR AMSAT NEWS SERVICE BULLETIN 090.02 FROM AMSAT HQ
SILVER SPRING, MD MARCH 31, 1990
TO ALL RADIO AMATEURS BT

N4HY Using DSP Techniques To Receive Mode S Packets From DOVE

This week AMSAT Ground Command Station N4HY accquired a Mode S receive only
down converter in order to facilitate his efforts in uploading software to
DOVE-OSCAR-17. However, due to a low index of modulation on the DOVE S Band
transmitter, Bob has had to resort to using Digital Signal Processing (DSP)
techniques in order to copy the packets transmitted on 2401.220 MHz. Another
factor which has caused him to turn to DSP to upload software is the very high
doppler shift present during Mode S passes for low-earth-orbiting (LEO)
satellites. On a recent DO-17 pass that WD0E and WD0HHU monitored in the
Denver, CO area, it was noted that there was about a 100 KHz shift in
frequency from the beginning to the end of the pass at 2401 MHz! With a
down converter and a 45 element loop yagi antenna obtained from Down East
Microwave, Bob will have to be able to have sufficient signal-to-noise
ratio (SNR) to succesfully complete the DOVE software upload process. Stay
tuned to AMSAT HF/VHF Nets for further information on the return of DO-17
telemetry to 145.825 MHz.

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SB ALL @ AMSAT $ANS-090.03
N6DBF TO COORDINATE DIAL-UP BBSS

HR AMSAT NEWS SERVICE BULLETIN 090.03 FROM AMSAT HQ
SILVER SPRING, MD MARCH 31, 1990
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AMSAT-NA Vice President for Operations, Courtney Duncan, N5BF, announces
the appointment of John Wisniowski, N6DBF, Operational Coordinator for
Dial-Up Bulletin Board System Activities. In this position, John will
be formalizing and expanding the now loosely connected system of dial-up
BBSs that carry AMSAT information on a regular basis into the "AMSAT
BBS Network."

Systems belonging to the AMSAT BBS Network will be listed as official
sources of AMSAT information (AMSAT News Service Bulletins, Orbital Elements,
and related releases) in AMSAT publications and will coordinate with N6DBF
to set up mechanisms for regular access to the information. Dial-up BBS
operators who are now performing this sort of service or would like to
be included in the AMSAT BBS Network are asked to contact:

John Wisniowski, N6DBF
1706 Roanoke St.
Placentia, California 92670

or leave a note for JOHN WISNIOWSKI on the DRIG/AMSAT BBS at 214-394-7438.

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SB ALL @ AMSAT $ANS-090.04
STS-35 MISSION APPROACHING LAUNCH

HR AMSAT NEWS SERVICE BULLETIN 090.04 FROM AMSAT HQ
SILVER SPRING, MD MARCH 31, 1990
TO ALL RADIO AMATEURS BT

SAREX activities by WA4SIR to be the longest in Shuttle Program

Long standing AMSAT member Ron Parise, WA4SIR, is a Mission Specialist on the Space Shuttle mission STS-35 scheduled to be launched May 9, 1990 from Cape Canaveral. Ron will be carrying a fair amount of amateur radio equipment on this mission and there will be upwards of 120 hours for amateur operation during the 10 day mission.

Ron will operate both 2 meter FM voice as well as 2 meter AFSK packet. The packet station (an HK-21 "pocket-packet TNC" marketed by Heathkit) will transmit bulletins providing updates on the mission and will operate in a ROBOT mode where stations on the ground can connect to the shuttle TNC and obtain a QSO number to validate the contact. The ROBOT should be available for about 90 hours during the flight.

Ron is scheduled to operate the 2 meter voice station during his off hours (for a total of about 30 hours) and he will spend a fair amount of time talking with school classrooms around the world offering them the opportunity to talk directly with an astronaut abord the Space Shuttle. NASA has authorized SAREX in order to "encourage youth to become excited about science and technology" and to publicize manned spaceflight to the general public.

This past week the amateur equipment to be used on the mission underwent EMI/EMC (Electro-Magnetic Interference/Electro-Magnetic Compatibility) tests. These tests are designed to determine the possibility of any interference the amateur equipment my inflict on any of the shuttle electronic systems. NASA has notified AMSAT that all the equipment passed the tests.

With SAREX on STS-35, Amateur Radio may have an opportunity to further the quest for international cooperation in space. Now that amateur radio activity on the MIR space station appears to have resumed, AMSAT is investigating whether there will be a mutual-visibility window between STS-35 and Mir for a first-ever Shuttle to Mir linkup. Adding to the excitement, the STS-35 Mission Commander is Vance Brand, who participated in the the Apollo/Soyuz program many years ago. Amateur Radio may get front page coverage if this history setting QSO is possible. As further details become available, they will be reported in the AMSAT News Service.

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SB ALL @ AMSAT $ANS-090.05
NEW TRACKING PROGRAM AVAILABLE

HR AMSAT NEWS SERVICE BULLETIN 090.05 FROM AMSAT HQ
SILVER SPRING, MD MARCH 31, 1990
TO ALL RADIO AMATEURS BT

SATSCAN-II Now Available in North America

AMSAT-UK has announced the release of their latest satellite tracking program in North America. SATSCAN-II is written for PC compatible computers (XT or AT) and is now available to North American amateurs through Project OSCAR. SATSCAN-II was written by Trevor Stockill (G4GPQ) and is an update of the popular SAT-SCAN program used by many AMSAT-UK members. While in the graphics mode of operation, SATSCAN-II incorporates a graphics display of the world, in full color on an EGA screen. The world map includes a footprint of the

coverage area provided by a particular satellite. A math co-processor will
improve calculation speed of SAT-SCAN-II but it is not required for operation.
CGA equipped PC's can use SATSCAN-II for output in non-graphical format.

SATSCAN-II is fully menu driven for easy operation. It also gives the user
complete azimuth and elevation tracking information including squint angle
data. Tracking information can be sent to a printer or to a disk file for
easy transmission by packet radio, or reproduction in club newsletters.
SATSCAN-II also provides the option to determine mutual visibility
windows for up to four stations at once, including mutual squint angle data.
Therefore, users will know when the best operation times will occur during
their schedules.

Keplerian Elements can be imported into SATSCAN-II as a text file in one of
three formats:

1 - typical AMSAT-NA multi-line format
2 - two line NASA element format
3 - DCE format as transmitted by UoSAT-OSCAR-11

In addition, Keplerian data may be entered by hand.

SATSCAN-II was originally obtained direct from AMSAT-UK, but is now available
in North America from Project OSCAR. All funds received from the SATSCAN-II
are directed to future Amateur Radio satellites. For additional information,
contact Project OSCAR and include a Self-Addressed, Stamped Envelope.

Project OSCAR, Inc.
Post Office Box 1136
Los Altos, California 94023-1136

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SB ALL @ AMSAT $ANS-090.06
AO-13 OPERATING SCHEDULE

HR AMSAT NEWS SERVICE BULLETIN 090.06 FROM AMSAT HQ
SILVER SPRING, MD MARCH 31, 1990
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AO-13 Transponder Schedule to 09May90

Mode-B : MA 000 to MA 165
Mode-JL : MA 165 to MA 195
Mode-S : MA 195 to MA 200
Mode-BS : MA 200 to MA 205
Mode-B : MA 205 to MA 256
Omnis   : MA 240 to MA 060

BLON = 207.6 and BLAT = 1.1   for 02Apr90

Only the Mode-S transponder and the Mode-B beacon will be on from
MA 195 to MA 200.

AO-10 is currently experiencing solar eclipses during major portions of it
orbit and until further notice its transponder is not available for use.

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SB ALL @ AMSAT $ANS-090.07
OPERATIONS NET SCHEDULE

HR AMSAT NEWS SERVICE BULLETIN 090.07 FROM AMSAT HQ
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AMSAT-NA Operations Net Schedule Announced

AMSAT Operations Nets are planned for the following times. Mode B nets are conducted on an AO-13 downlink frequency of 145.950. Mode J/L nets are conducted on an AO-13 downlink frequency of 435.970. All nets in the current cycle occur on Saturday U. S. time.

Date UTC	Time	Phs	Mode	NCS
01 Apr 90	0400	118	B	N5BF
07 Apr 90	1300	212	B	N5BF
15 Apr 90	0210	168	J/L	N5BF
22 Apr 90	0400	127	B	N5BF
28 Apr 90	1300	221	B	N5BF
06 May 90	0145	168	J/L	N5BF

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